

Accessory Rail Cart (ARC) Equipment Platform



OVERVIEW

DataTraks was commissioned to create a platform to gather data on the move that was quieter than the standard options of a train- or truck-mounted sensor array. The ARC (Accessory Rail Cart) was originally developed as a tool to enable the development, testing, and calibration of wayside detector systems.

This multi-purpose platform is much quieter and less expensive to operate than other options. It also improves the safety of operations because there is no human directly involved in the on-track operations it performs. For example, a standard on-rail truck is required to maintain a minimum distance from any train it is following to ensure the safety of the driver. The driverless ARC is not required maintain that same distance from a train.

A quick-mount rail-and-bracket system on the unit allows configuration with a variety of sensors, speakers, cameras, and other equipment, as needed. Heavy-duty nylon wheel hubs help damp noise and break the electric connection across the wheels and axel so the cart does not shunt the rail.



PHYSICAL SPECIFICATIONS

Weight: approximately 1,000 lbs.
Payload weight: 1000 lbs.

Cart construction: welded 16-gauge structural steel
Battery weight: 360 lbs.
Dimensions: 50" x 72" x 19"

Drivetrain: Direct-drive electric A/C

Power supply: six 8V-batteries
Amperage: 650
Hp: 16.5 continuous, 48 maximum

Speed: up to 40 mph
Braking: Electric traction
Wheels: 16 inch steel wheels with heavy-duty Nylon hubs



USES

- Accurate GPS mapping of track layouts
- Wayside detector calibration
- Automated rail geometry measurements
- Rail break detection
- Track inspection

CONTROL SYSTEM SPECIFICATIONS

Control application: Custom software application

Control system: 900 Mhz point-to-point radios

Control range: 1-2 miles

Safety measures:

- automatically stops after losing contact with operator for 5 seconds
- automatically stops if 3-axis accelerometer detects forces in excess of pre-set limits

The ARC's safety system includes LED lighting front and rear, and high-visibility accents. An on-board automated system stops the unit if the radio connection is lost or a three-axis accelerometer detects forces that exceed pre-set thresholds. Attachment points on the frame allow the cart to be placed on and removed from the track with a standard hoist. The steel frame has mounts for rubber wheels that are used for ground transport.

CUSTOM CONFIGURATION

There are a number of ways a unit can be custom configured to meet specific needs, or to provide a universal platform capable of a variety of tasks.

OPTIONS INCLUDE:

- A transmission to increase top speed
- Solar trickle charging
- Custom mounting options for sensors
- Standard capability for automated stop after traveling a predetermined distance

Ongoing work will explore ways to make the unit faster and quieter, and increase its ability to operate safely with less user intervention.

CONCLUSION

The ARC provides railroads with a safe, quiet, affordable way to gather data and handle a number of track analysis and data collection tasks.

